

# **ABSTRACT**

A method and apparatus for fractionation of a mixture of particles and for particle analysis are provided, in which LEAPS ("Light-controlled Electrokinetic Assembly of Particles near Surfaces") is used to fractionate and analyze a plurality  
5 of particles suspended in an interface between an electrode and an electrolyte solution. A mixture of particles are fractionated according to their relaxation frequencies, which in turn reflect differences in size or surface composition of the particles. Particles may also be analyzed to determine their physical and chemical properties based on particle relaxation frequency and maximal velocity.